



Summary of Fishery Surveys Rib Lake, Taylor County, 2008 and 2014 – 2015

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in 2008 and 2014–2015 to assess the status of important fish populations in Rib Lake. Fyke nets set shortly after the spring thaw targeted walleye, muskellunge, northern pike, and yellow perch. We estimated walleye population density from the ratio of marked fish recaptured in our early spring 2015 electrofishing survey. Electrofishing surveys in late-spring documented the abundance and size structure of largemouth bass and bluegill populations. A fall electrofishing survey documented recruitment of age-0 walleye and other gamefish. Fyke netting in early October yielded useful information on black crappies. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. The designation of “keeper size” is based on known angler behavior.

Survey Effort

On April 24th, 2008 we set five fyke nets when water temperature was 38–42°F and fished them over one night for a total five net-nights of effort. Three nets specifically targeted walleyes while two were set to intercept other early spring spawners. Seven years later on April 3rd, 2015 with ice still lingering on some shorelines we set five fyke nets at known walleye spawning sites when water temperature averaged 37°F. We fished the nets at seven locations (usually tending them on alternate days) until April 14th, 2015 when water temperatures reached 51°F for 55 net-nights of effort directed primarily toward walleyes. We estimated walleye population density (the number of adults per acre), following the standard protocol for treaty fishery assessments. After marking a target number of walleyes, on April 14th, 2015 we removed our nets and completed an electrofishing circuit of the entire shoreline (3.93 miles) when water temperature was 49°F.

Our 2008 electrofishing survey took place on the night of May 19th when water temperature was 57°F. We surveyed 3.18 miles of shoreline in 1.60 hours. Our survey may have been completed slightly early to properly characterize population status as the water was probably still too cold to trigger largemouth bass and bluegill spawning activities. With water temperature averaging 64.6°F our late spring electrofishing survey on May 26th, 2015 should have coincided with pre-spawn movements of largemouth bass and bluegills when both are most vulnerable to capture by electrofishing. We sampled 3.00 miles of shoreline in 1.40 hours including 0.50 miles sub-sampled for all species in 0.27 hours. Intermittent lighting malfunctions and poor visibility caused by heavy rainfall in the last mile of electrofishing decreased our capture efficiency somewhat.

As part of the treaty fishery assessment we surveyed 3.19 miles of shoreline in 1.60 hours with our large electrofishing boat on September 21st, 2015 when water temperatures averaged 66.5°F. We collected

only gamefish, giving highest priority to dip-netting young walleyes. Very turbid water reduced visibility and fish capture efficiency.

When we evaluated Rib Lake's fishery again at its seven-year survey frequency, we added a fall netting assessment specifically targeting black crappies. We set five fyke nets on October 6th, 2014 and fished them over one night (5 net-nights) when water temperatures averaged 50°F.

A creel clerk from WDNR's Treaty Fishery Assessment Team counted and interviewed anglers on all weekends and holidays and 3 randomly-selected weekdays per week from May 2–October 31, 2015 to estimate angling pressure and harvest in the open water period. The creel survey planned for winter 2015–2016 was cancelled.

Habitat Characteristics

Rib Lake is a shallow, 320-acre drainage lake located near the headwaters of the Rib River in the Village of Rib Lake, WI. Two unnamed streams, locally called Tannery Creek and Copper Creek, are its two tributaries. A low-head roller dam on the outlet maintains a stable water level. Average depth is 6 feet, and maximum depth is 9 feet. Dissolved mineral concentrations correspond generally to a hard water classification. The littoral bottom substrate is 50% muck, 30% sand, and 20% gravel. Decades of sawmill and tannery operations in the late 1800s and early 1900s resulted in deposition of large quantities of organic waste (sawdust, unused trees and saw wood, and animal hides and hair) that has accumulated and decreased depth throughout most of the lake. As a result of high nutrient concentrations, Rib Lake is eutrophic and prone to severe summer algae blooms and winter fish kills that are caused by depleted dissolved oxygen levels under ice cover. For many years, the risk and severity of winterkill losses have been lessened by the Rib Lake Area Fish & Game Association's commitment to maintain and operate a lake aeration system. An electric-powered blower pumps air through seven submerged diffuser lines to circulate the warmer bottom water and keep an ice-free area where atmospheric oxygen can dissolve and provide a refuge with better conditions for fish survival. State Highway 102 and several city streets run parallel to the north and east shores. The surrounding uplands are hardwood forest or areas developed for residential and municipal use. Near the outlet a black spruce bog occupies about 15% of the shoreline. Rib Lake has two public boat landings each with a boarding dock and a fishing pier. Two additional shorefishing facilities have convenient roadside access on the east and west sides, and the Village maintains several parks with pavilions, a playground, a campground, and other recreational improvements nearby.

Summary of Results

We captured 14 fish species in our 2008 and 2014–2015 surveys. Walleye were the dominant predator, and black crappies were by far the most abundant panfish species. Bullheads were extremely abundant in spring 2008 fyke nets when we captured up to 45 gallons of bullheads per lift, mostly black bullheads 6–8 inches long. Bullhead abundance was substantially lower in our 2015 early spring netting survey when we counted only 1,100 bullheads in 55 net-nights of effort. Believing that abundant bullheads compete with more desirable sport fish for limited resources, Rib Lake Area Fish & Game Association volunteers deploy fyke nets to capture and remove many tons of bullheads (19,440 pounds in 2014) with authorization that WDNR has renewed annually for many years. From May 2–October 31, 2015

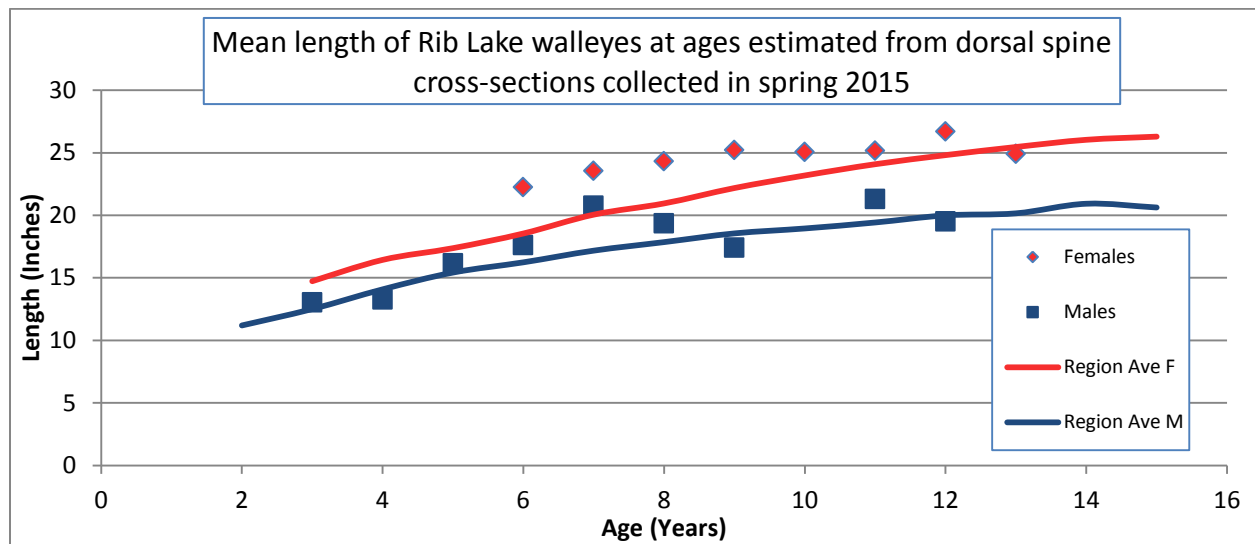
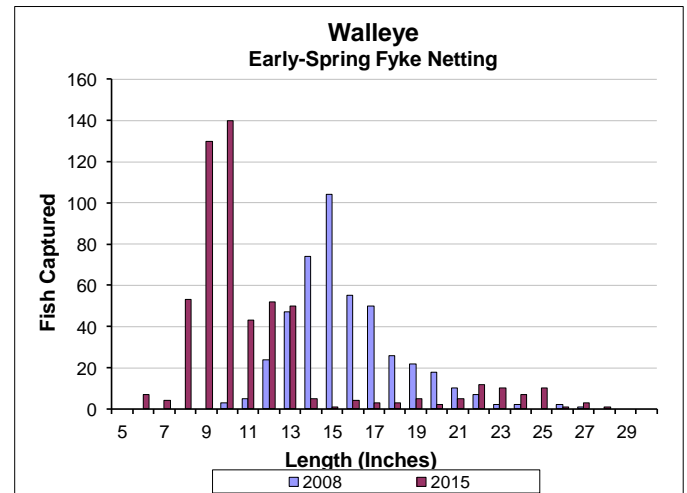
projected fishing pressure on Rib Lake was 20.3 hours/acre, ranking in the 39th percentile of 464 similar estimates from summer creel surveys completed on the Ceded Territory in 1990–2012.

Walleye



Early Spring Fyke Nets

	Number per net-night $\geq 10''$	Quality Size $\geq 15''$	Objective Size $\geq 18''$	Preferred Size $\geq 20''$	Memorable Size $\geq 25''$
2008	90	66%	20%	9%	0.7%
2015	8.3	19%	17%	14%	4%



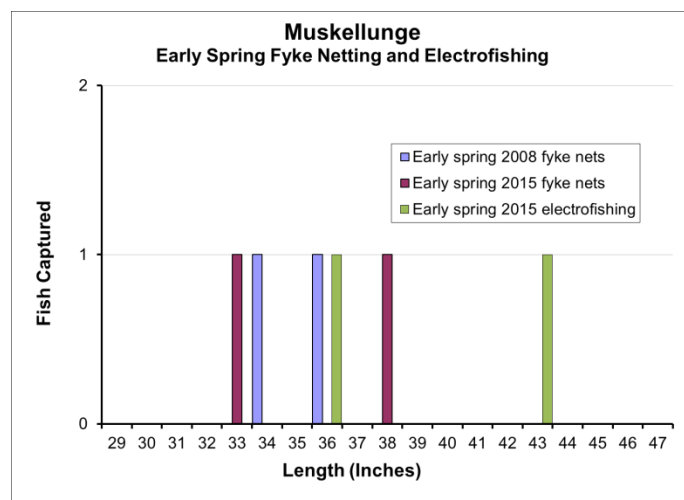
Comparing our spring fyke netting catch rates, the abundance of walleyes ≥ 10 inches declined dramatically between 2008 and 2015. The speculative cause for this decline is excessive angling harvest (some perhaps illegal) that exploited a high percentage of the adult population in the ice-covered and open-water periods 2009–2011. Our spring 2015 estimate of 0.7 adults per acre fell short of the goal for moderate population density defined in the 2003 *Rib Lake Fishery Management Plan* as 5–10 walleyes ≥ 10 inches per acre. On a positive note, at lower abundance the walleye population grew at a satisfactory rate and produced higher proportions of preferred- and memorable-size fish. Walleye size structure in 2015 nearly met or exceeded the two *Fishery Management Plan* objectives that 20–40% should be 15 inches or longer and 5–10% should be at least 18 inches long. Age analysis using dorsal spine cross-sections from fish ≥ 12 inches and scales from smaller fish showed that male walleyes grew close to and females attained slightly above the regional average length at ages 3–13. Both males and

females were long lived, reaching ages up to 13 years old. A large proportion of the fish captured in 2015 were small, young walleyes, pointing toward a brighter future for the population which currently has few fish of intermediate size and age. Though walleyes do spawn in Copper Creek and on the gravel along the east shore, we believe that large fingerlings stocked annually contribute most new recruits to the adult population. Under a Cooperative Fish Rearing Agreement, WDNR delivers small walleyes (1.5–2.5") to nearby ponds in early summer. The Rib Lake Area Fish & Game Association, with support from neighboring sportsmen's organizations, purchases forage to grow those fingerlings to 6–8 inches by early October. Each year volunteers harvest the ponds and transport large walleye fingerlings to Rib Lake and 12–14 local lakes, stocking them usually at rates of 5–10 fingerlings per acre to supplement predatory control of panfish and to offer bonus walleye fishing opportunity where the habitat and fish community characteristics favor other species. Projections from the creel survey revealed that anglers caught 358 walleyes and harvested 15 in 3,276 hours of fishing effort directed specifically toward walleyes. Walleyes were the second most sought after fish, receiving 23% of the directed fishing effort in summer.

Muskellunge



	Number per net-night ≥ 20 "	Quality Size ≥ 30 "	Preferred Size ≥ 38 "	Memorable Size ≥ 42 "
2008	0.4	100%	0%	0%
2015	0.04	100%	50%	0%

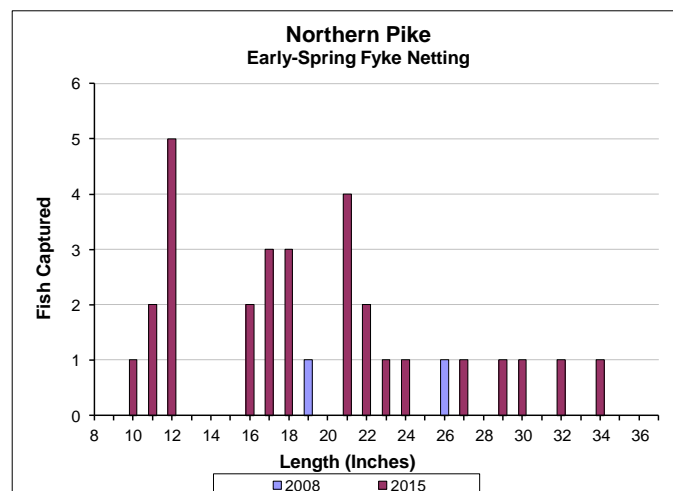


The length distribution and low capture rates of muskellunge in our early spring 2008 and 2015 netting and electrofishing surveys suggest that natural reproduction has produced enough new recruits to maintain the population at low levels of abundance since stocking ended in 2002. Any survivors from that last stocking should have grown considerably longer than 33 or 36 inches after 12 years at large in a highly productive lake. Our early spring surveys focused primarily on capturing adult walleyes, which typically spawn earlier at lower water temperature than muskellunge do, so those samples may have underestimated musky abundance and perhaps also their size. Volunteers using fyke nets to remove bullheads at warmer water temperatures reported on average 25 muskellunge (most over 40") in their bycatch in 2009, 2011, 2013, and 2014. The largest musky that we measured in these surveys was 43 inches long, but annual reports of bullhead removal efforts cited muskies captured and released up to 48 inches long. Though our small survey samples have limited value in assessing musky population status, we can add reports from anglers and bullhead netting to cautiously infer that Rib Lake's muskellunge population comes close to the goal in the *2003 Fishery Management Plan* for a moderate density of large fish 40 inches or longer. We injected passive integrated transponders (PIT tags) into all four muskies captured in 2015 to track their growth and survival if we recapture them in future surveys.

Northern Pike



	Number per net-night ≥ 14 "	Quality Size ≥ 21 "	Preferred Size ≥ 28 "	Memorable Size ≥ 34 "
2008	0.4	50%	0%	0%
2015	0.5	62%	19%	5%

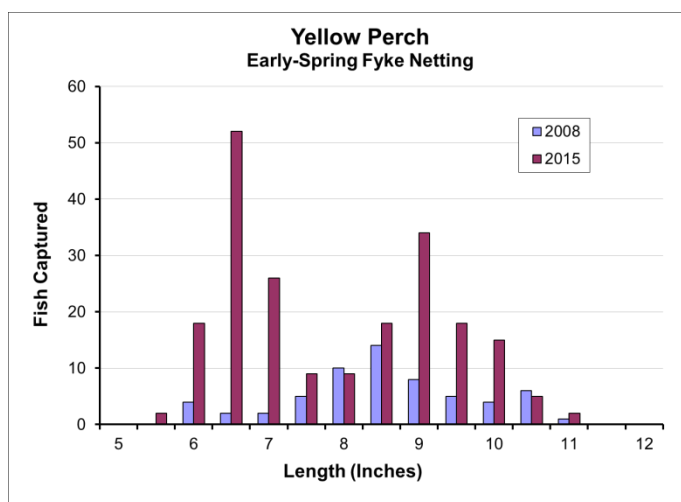


The low capture rate and respectable size distribution of northern pike in early spring 2015 fyke nets suggest that Rib Lake has the low-density population of medium-size pike established as the goal in the *2003 Fishery Management Plan*. Relative abundance, as reflected by fyke netting catch per effort in early spring, was similar in 2008 and 2015. At such low levels of abundance, pike continue to have little effect on the ecosystem, their growth appears satisfactory to produce proportions of preferred- and memorable-size fish that exceed our expectations (25–35% ≥ 21 " and 10–20% ≥ 24 "), and they provide angling diversity and opportunity to land a fish over 30 inches long. Northern pike and muskies drew only 1.9 and 2.2% percent of directed angling effort in summer. The creel survey projected low catch (15 and 2, respectively) and no harvest of these species.

Yellow Perch



	Number per net-night ≥ 5 "	Quality Size ≥ 8 "	Objective Size ≥ 9 "	Preferred Size ≥ 10 "
2008	12	79%	39%	18%
2015	4.1	49%	36%	11%



We have very little experience assessing yellow perch populations of inland waters, and it is difficult to accurately evaluate perch abundance by using traditional survey methods, but we will cautiously examine early spring fyke netting data while other approaches are developed. Our capture rate of yellow perch in early spring fyke nets decreased threefold between 2008 and 2015. The direction of the change was surprising in relation to the eleven fold decrease in walleye catch per fyke net-night over the same period. Yellow perch are the preferred food of all Rib Lake predators, and prey abundance can often change in response to an increase or decrease in predator density. But with northern pike,

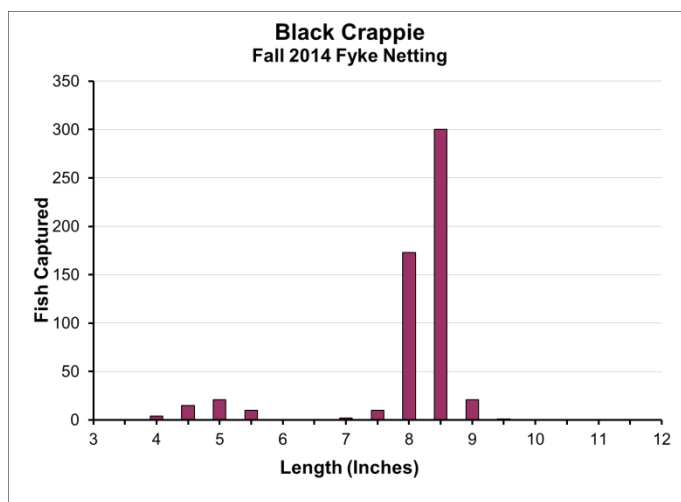
largemouth bass, and muskellunge all in low abundance and fewer walleyes and to eat young perch we would expect that the perch population's recruitment rate and numbers would increase, rather than decrease as our fyke net capture rates suggest. Sometimes perch appear episodically in fyke nets, but those daily variations should have been dampened in 55 net-nights over 11 days and a 14-degree water temperature range. Both surveys showed that perch in Rib Lake exceeded the objectives for population size structure (20–40% of perch $\geq 5''$ should be $\geq 8''$ and 5–10% should be $\geq 9''$). Hoping to boost Rib Lake's yellow perch population, local sportsmen purchased and stocked a total of nearly 17,000 yellow perch 3–5.5 inches long in 2002, 2007, 2013, and 2015. Yellow perch received about 15% of summer angling effort. Consistent with other measures of low abundance, creel survey projections show that anglers caught relatively few perch (344), keeping 47% of their catch.

Black Crappie



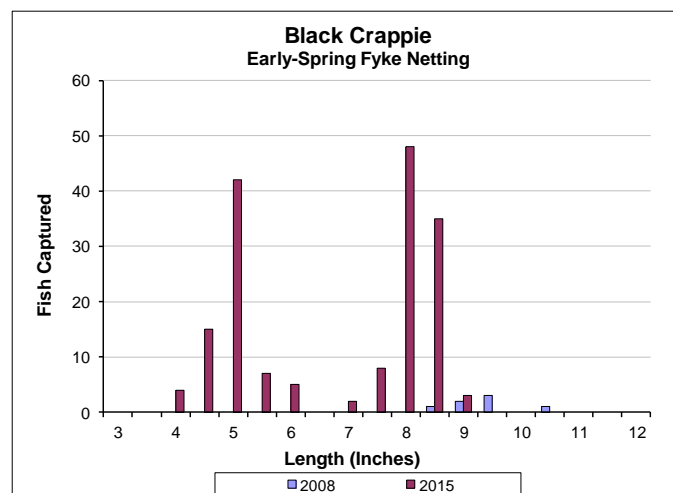
2014 Fall Fyke Netting

Captured 108 per net-night $\geq 5''$	
Quality Size $\geq 8''$	92%
Preferred Size $\geq 10''$	0%
Memorable Size $\geq 12''$	0%



Early-Spring Fyke Netting

	Number per net-night $\geq 5''$	Quality Size $\geq 8''$	Preferred Size $\geq 10''$	Memorable Size $\geq 12''$
2008	1.4	100%	14%	0%
2015	38	57%	0%	0%



Comparing catch rates of black crappies in early spring 2008 and 2015 fyke nets shows that population abundance has skyrocketed in Rib Lake as a result of two equally strong year classes produced in 2010 and 2012. Fall nets portrayed a similar population status, though the 2010 year class comprised a smaller share of the population in that sample. Analysis of otolith (earbone) cross sections revealed that the higher population density has resulted in slower-than-average growth rates with black crappies reaching on average 8.6 inches after 5 growing seasons (range 7.6–9.3; $n=18$), compared to the regional average length of 9.3 inches at age 5. We extracted otoliths from 5 black crappies per half-inch group

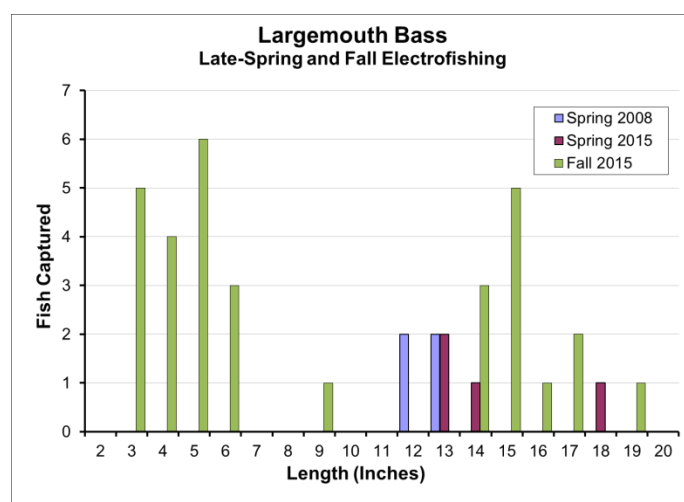
7.0–8.9 inches, so we cannot judge growth performance of the 2012 year class. We did not capture enough black crappies in our 2008 surveys to access their size distribution then. Fall 2014 and spring 2015 fyke nets revealed that the population exceeded the objective range for quality-size fish (30–50%), but it fell short of the desired proportion of preferred-size fish (5–15%). Anglers may enjoy good crappie fishing in the next few years, if the slow-growing 2010 year class can survive long enough to reach preferred size. However, if crowding and food competition are so intense and growth rate slows so much that age-5 crappies cannot gain 0.5 to 1 inch per year, then most individuals will likely die of natural causes before they can attain the sizes that people like to keep. Black crappies received most (39%) of the directed angling effort in summer. Angler caught an estimated 14,085 crappies in the open-water season, and they kept two-thirds of their catch. Average length of harvested crappies increased steadily through the summer growing season from 8.8 to 9.5 inches.

Largemouth Bass



Electrofishing

	Number per mile $\geq 8''$	Number per hour $\geq 8''$	Quality Size $\geq 12''$	Legal Size $\geq 14''$	Preferred Size $\geq 15''$
Spring 2008	1.3	2.5	100%	0%	0%
Spring 2015	1.3	2.9	100%	50%	25%
Fall 2015	2.2	8.1	92%	92%	69%



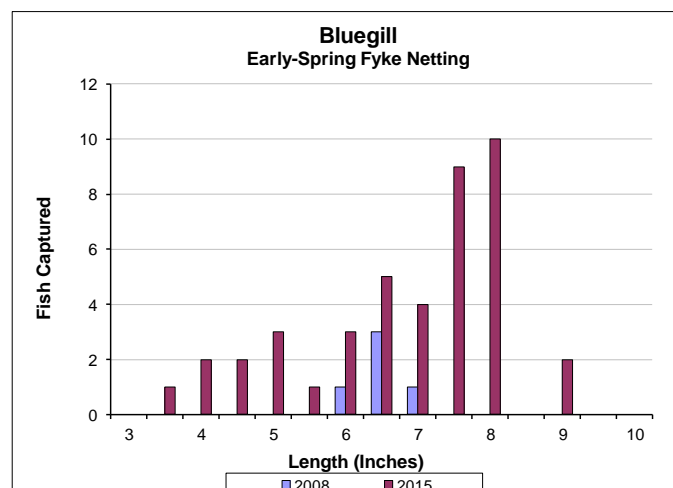
We captured largemouth bass in our late-spring 2008 and 20015 electrofishing surveys at rates well below the objective rate (20–40 bass $\geq 8''$ per hour) chosen to represent the moderate population density desired. Our fall 2015 electrofishing survey captured young bass < 7 inches long, verifying that natural reproduction added new recruits in successive year classes. We caught more adult bass by electrofishing in fall than in our two late spring electrofishing surveys combined, suggesting that we may have missed the peak bass spawning period and that bass population may be better off than our spring electrofishing results indicate. We did not capture enough bass to confidently draw conclusions about their size structure, but a pooled sample from spring and fall electrofishing included a wide range of sizes and proportions of quality- and preferred-size fish (86 and 48%, respectively). We suspect a well-timed spring electrofishing survey would reveal largemouth bass size structure near the objectives we established for the population (40–60% $\geq 12''$ and 10–20% $\geq 15''$). Typically, largemouth bass acting alone are ineffective at controlling panfish abundance by predation to offer good panfish angling opportunity in most northern Wisconsin lakes larger than about 100 acres. However, combined predatory pressure from largemouth bass and walleyes both in moderately high abundance can serve to curb recruitment, avoid crowding, maintain adequate growth rates, and produce favorable shares of preferred-size fish in bluegill and crappie populations. Very little angling effort intentionally targeted largemouth bass. Only bullheads received a smaller proportion of directed fishing effort (1.5% versus 1.0%) in the open water season. Projections show that anglers caught 72 largemouth bass, but harvested none.

Bluegill



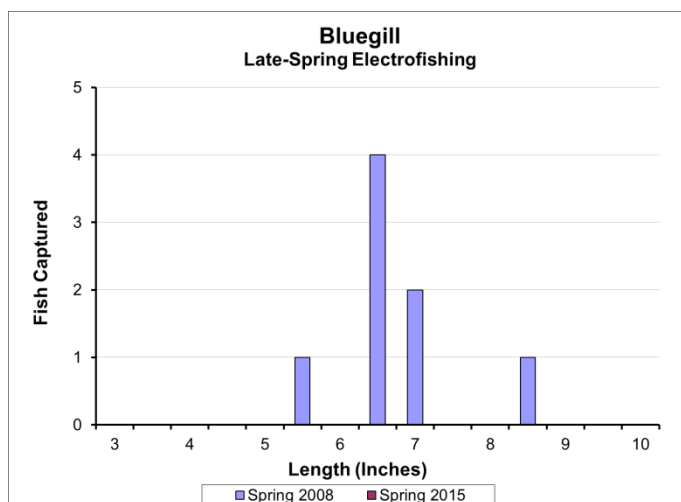
Early-Spring Fyke Netting

	Number per net-night $\geq 3''$	Quality Size $\geq 6''$	Keeper Size $\geq 7''$	Preferred Size $\geq 8''$
2008	1.0	100%	20%	0%
2015	1.6	79%	60%	29%



Late-Spring Electrofishing

	Number per mile $\geq 3''$	Number per hour $\geq 3''$	Quality Size $\geq 6''$	Keeper Size $\geq 7''$	Preferred Size $\geq 8''$
2008	2.5	5.0	88%	38%	13%
2015	-	-	-	-	-



Our netting and electrofishing capture rates reflected very low bluegill population abundance in Rib Lake that was similar in 2008 and 2015. In both years electrofishing catch rates were far below the benchmark of 100–150 bluegills per hour in late spring electrofishing surveys, suggesting perhaps that this goal may need adjustment to make it attainable and compatible with the apparent low recruitment rate in Rib Lake’s bluegill population. We captured no bluegills by electrofishing in late spring 2015. Walleyes undoubtedly influence bluegill recruitment, especially if low water clarity inhibits aquatic plant growth, limiting hiding cover where young bluegill can avoid predation. Effective predatory control of bluegill abundance is usually welcomed as an essential ingredient for good panfish angling, but in this case walleyes seem to be suppressing bluegill recruitment below the rate necessary to produce the desired adult bluegill abundance.

Weather probably affected our electrofishing catch in both late spring surveys. In 2008 water temperature was 57°F, much too cold to draw spawning bluegills toward shallow water nesting sites where they would be vulnerable to capture by electrofishing gear. Likewise, cold and rainy weather with water temperature 64°F may have temporarily driven fish to deeper water in our late-spring 2015 electrofishing survey. Though we did not measure or count bluegills in our fall 2015 electrofishing run, bluegill were noted as “common,” suggesting that late spring 2008 and 2015 samples may be flawed and that carefully-timed electrofishing samples collected in early- to mid-June at slightly higher water

temperature might better represent bluegill population status in surveys next scheduled 2022 or in surveys for that purpose before then.

Although we did not take scales or bones to estimate age, we can indirectly infer that Rib Lake bluegills grow at a satisfactory rate at such low population abundance. Spring 2015 fyke nets captured high proportions of keeper- and preferred-size bluegills that were undetected by electrofishing six weeks later. Fyke netting in 2015 yielded percentages of quality- and keeper-size bluegills that exceeded the conservative objectives developed for the family-oriented fishery ($40\text{--}60\% \geq 6''$ and $25\text{--}35\% \geq 7''$).

In 2007 volunteers from the Rib Lake Area Fish & Game Association tried to raise bluegills and other panfish in local ponds, but the 900 bluegills stocked represented marginal return for their investment with no noticeable effect on Rib Lake's panfish populations.

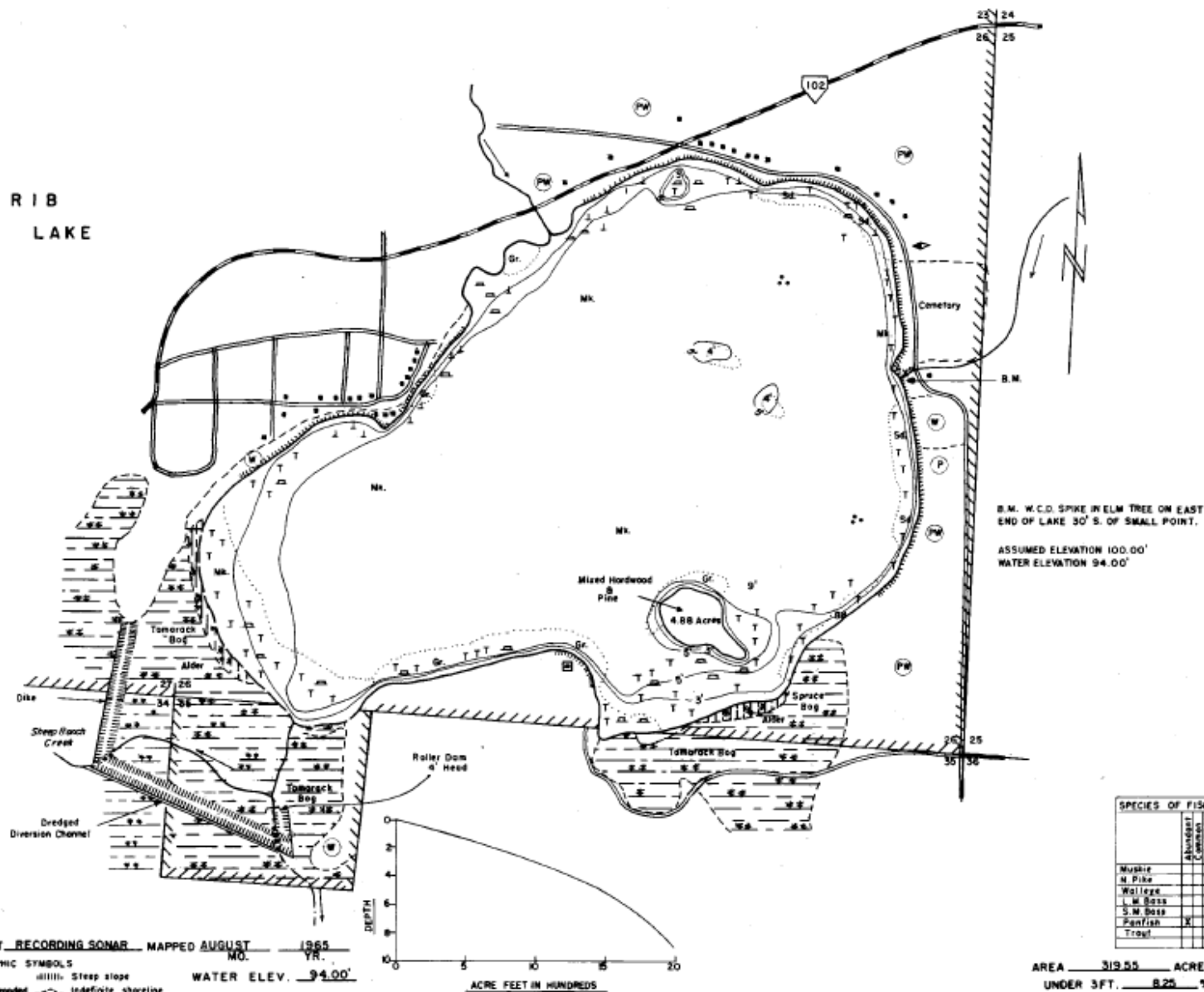
Bluegills received nearly the same amount of directed fishing effort as yellow perch. Anglers caught an estimated 544 bluegills, and they kept 37%.

Survey data collected and analyzed by: Sam Hetzel, Jessica Krajniak, Chad Leanna, Kendal Patrie, Greg Rublee, Jeff Scheirer, Evan Sniadajewski, and Jeanette Wendler—WDNR Fishery Team, Park Falls.

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Reviewed and edited by: Jeff Scheirer—Fishery Biologist, February 2016

Approved for web posting by: Mike Vogelsang—Northern Administrative District Supervisor, February 2016.

RIB
LAKEB.M. W.C.D. SPIKE IN ELM TREE ON EAST
END OF LAKE 30' S. OF SMALL POINT.ASSUMED ELEVATION 100.00'
WATER ELEVATION 94.00'EQUIPMENT RECORDING SONAR MAPPED AUGUST 1965
MO. YR.

TOPOGRAPHIC SYMBOLS

- ① Brush
- ② Partially wooded
- ③ Wooded
- ④ Cleared
- ⑤ Pastured
- ⑥ Agricultural
- B.M. Bench Mark
- Dwelling
- Resort
- ||||| Steep slope
- Indefinite shoreline
- ▲ Marsh
- Spring
- Intermittent stream
- Permanent inlet
- Permanent outlet
- Dam

WATER ELEV. 94.00'

LAKE BOTTOM SYMBOLS

- P. Peat
- Mk. Muck
- C. Clay
- M. Mott
- Sd. Sand
- St. Silt
- Gr. Gravel
- R. Rubble
- Br. Bedrock
- T. Submerged vegetation
- E. Emergent vegetation
- △ Floating vegetation
- ▲ Stumps or Snags

ACRE FEET IN HUNDREDS

SCALE

Access Access with Parking Boat Livery

Field work by: G. Miller, M. Perkins, J. Sather. Drawn by: J. Bath

SPECIES OF FISH		Abundant	Common	Rare
Muskie				
N. Pike				
Walleye				
L. W. Bass			X	
S. W. Bass				
Panfish		X		
Trout				

AREA 319.55 ACRES

UNDER 3 FT. 8.25 %

OVER 20 FT. 0 %

VOLUME 1977.27 ACRE FT.

TOTAL ALK. 6.8 P.P.M.

SHORELINE 3.33 MILES

MAX. DEPTH 9 FEET